



SEQUENCE LISTING

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<120> Cellulase Variants

<130> 4887.204-US

<140> 09/261,329

<141> 1999-03-03

<150> 1013/96

<151> 1996-09-17

<160> 26

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 202

<212> PRT

<213> Cellulase variants

<400> 1

Ala Asp Gly Arg Ser Thr Arg Tyr Trp Asp Cys Cys Lys Pro Ser Cys
1 5 10 15
Gly Trp Ala Lys Lys Ala Pro Val Asn Gln Pro Val Phe Ser Cys Asn
20 25 30
Ala Asn Phe Gln Arg Ile Thr Asp Phe Asp Ala Lys Ser Gly Cys Glu
35 40 45
Pro Gly Gly Val Ala Tyr Ser Cys Ala Asp Gln Thr Pro Trp Ala Val
50 55 60
Asn Asp Asp Phe Ala Leu Gly Phe Ala Ala Thr Ser Ile Ala Gly Ser
65 70 75 80
Asn Glu Ala Gly Trp Cys Cys Ala Cys Tyr Glu Leu Thr Phe Thr Ser
85 90 95
Gly Pro Val Ala Gly Lys Lys Met Val Val Gln Ser Thr Ser Thr Gly
100 105 110
Gly Asp Leu Gly Ser Asn His Phe Asp Leu Asn Ile Pro Gly Gly Gly
115 120 125
Val Gly Ile Phe Asp Gly Cys Thr Pro Gln Phe Gly Gly Leu Pro Gly
130 135 140
Gln Arg Tyr Gly Gly Ile Ser Ser Arg Asn Glu Cys Asp Arg Phe Pro
145 150 155 160
Asp Ala Leu Lys Pro Gly Cys Tyr Trp Arg Phe Asp Trp Phe Lys Asn
165 170 175
Ala Asp Asn Pro Ser Phe Ser Phe Arg Gln Val Gln Cys Pro Ala Glu
180 185 190
Leu Val Ala Arg Thr Gly Cys Arg Arg Ala
195 200

<210> 2

<211> 202

<212> PRT

<213> Cellulase variants

<400> 2

Gly Ser Gly His Thr Thr Arg Tyr Trp Asp Cys Cys Lys Pro Ser Cys
1 5 10 15

Ala	Trp	Asp	Glu	Lys	Ala	Ala	Val	Ser	Arg	Pro	Val	Thr	Thr	Cys	Asp
			20					25					30		
Arg	Asn	Asn	Ser	Pro	Leu	Ser	Pro	Gly	Ala	Val	Ser	Gly	Cys	Asp	Pro
		35					40					45			
Asn	Gly	Val	Ala	Phe	Thr	Cys	Asn	Asp	Asn	Gln	Pro	Trp	Ala	Val	Asn
	50					55				60					
Asn	Asn	Val	Ala	Tyr	Gly	Phe	Ala	Ala	Thr	Ala	Phe	Pro	Gly	Gly	Asn
65					70					75				80	
Glu	Ala	Ser	Trp	Cys	Cys	Ala	Cys	Tyr	Ala	Leu	Gln	Phe	Thr	Ser	Gly
				85					90					95	
Pro	Val	Ala	Gly	Lys	Thr	Met	Val	Val	Gln	Ser	Thr	Asn	Thr	Gly	Gly
			100					105					110		
Asp	Leu	Ser	Gly	Thr	His	Phe	Asp	Ile	Gln	Met	Pro	Gly	Gly	Gly	Leu
		115					120					125			
Gly	Ile	Phe	Asp	Gly	Cys	Thr	Pro	Gln	Phe	Gly	Phe	Thr	Phe	Pro	Gly
	130					135					140				
Asn	Arg	Tyr	Gly	Gly	Thr	Thr	Ser	Arg	Ser	Gln	Cys	Ala	Glu	Leu	Pro
145					150					155				160	
Ser	Val	Leu	Arg	Asp	Gly	Cys	His	Trp	Arg	Tyr	Asp	Trp	Phe	Asn	Asp
				165					170					175	
Ala	Asp	Asn	Pro	Asn	Val	Asn	Trp	Arg	Arg	Val	Arg	Cys	Pro	Ala	Ala
			180					185					190		
Leu	Thr	Asn	Arg	Ser	Gly	Cys	Val	Arg	Ala						
		195					200								

<210> 3
 <211> 202
 <212> PRT
 <213> cellulase variants

<400> 3

Gly	Thr	Gly	Arg	Thr	Thr	Arg	Tyr	Trp	Asp	Cys	Cys	Lys	Pro	Ser	Cys
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Gly	Trp	Asp	Glu	Lys	Ala	Ser	Val	Ser	Gln	Pro	Val	Lys	Thr	Cys	Asp
			20					25					30		
Arg	Asn	Asn	Asn	Pro	Leu	Ala	Ser	Thr	Ala	Arg	Ser	Gly	Cys	Asp	Ser
		35					40					45			
Asn	Gly	Val	Ala	Tyr	Thr	Cys	Asn	Asp	Asn	Gln	Pro	Trp	Ala	Val	Asn
	50					55				60					
Asp	Asn	Leu	Ala	Tyr	Gly	Phe	Ala	Ala	Thr	Ala	Phe	Ser	Gly	Gly	Ser
65					70					75				80	
Glu	Ala	Ser	Trp	Cys	Cys	Ala	Cys	Tyr	Ala	Leu	Gln	Phe	Thr	Ser	Gly
				85					90					95	
Pro	Val	Ala	Gly	Lys	Thr	Met	Val	Val	Gln	Ser	Thr	Asn	Thr	Gly	Gly
			100					105					110		
Asp	Leu	Ser	Gly	Asn	His	Phe	Asp	Ile	Leu	Met	Pro	Gly	Gly	Gly	Leu
		115					120					125			
Gly	Ile	Phe	Asp	Gly	Cys	Thr	Pro	Gln	Trp	Gly	Val	Ser	Phe	Pro	Gly
	130					135					140				
Asn	Arg	Tyr	Gly	Gly	Thr	Thr	Ser	Arg	Ser	Gln	Cys	Ser	Gln	Ile	Pro
145					150					155				160	
Ser	Ala	Leu	Gln	Pro	Gly	Cys	Asn	Trp	Arg	Tyr	Asp	Trp	Phe	Asn	Asp
				165					170					175	
Ala	Asp	Asn	Pro	Asp	Val	Ser	Trp	Arg	Arg	Val	Gln	Cys	Pro	Ala	Ala
			180					185					190		
Leu	Thr	Asp	Arg	Thr	Gly	Cys	Arg	Arg	Ala						
		195					200								

<210> 4
 <211> 201
 <212> PRT
 <213> Cellulase variants

<400> 4

Gly	Ser	Gly	Lys	Ser	Thr	Arg	Tyr	Trp	Asp	Cys	Cys	Lys	Pro	Ser	Cys
1				5					10					15	

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<210> 5
<211> 201
<212> PRT
<213> Cellulase variants
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<210> 6
<211> 203
<212> PRT
<213> Cellulase variants
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<400> 6

Gly Ser Gly His Ser Thr Arg Tyr Trp Asp Cys Cys Lys Pro Ser Cys
1 5 10 15

Ser Trp Ser Gly Lys Ala Ala Val Asn Ala Pro Ala Leu Thr Cys Asp
 20 25 30
 Lys Asn Asp Asn Pro Ile Ser Asn Thr Asn Ala Val Asn Gly Cys Glu
 35 40 45
 Gly Gly Gly Ser Ala Tyr Ala Cys Thr Asn Tyr Ser Pro Trp Ala Val
 50 55 60
 Asn Asp Glu Leu Ala Tyr Gly Phe Ala Ala Thr Lys Ile Ser Gly Gly
 65 70 75 80
 Ser Glu Ala Ser Trp Cys Cys Ala Cys Tyr Ala Leu Thr Phe Thr Thr
 85 90 95
 Gly Pro Val Lys Gly Lys Lys Met Ile Val Gln Ser Thr Asn Thr Gly
 100 105 110
 Gly Asp Leu Gly Asp Asn His Phe Asp Leu Met Met Pro Gly Gly Gly
 115 120 125
 Val Gly Ile Phe Asp Gly Cys Thr Ser Glu Phe Gly Lys Ala Leu Gly
 130 135 140
 Gly Ala Gln Tyr Gly Gly Ile Ser Ser Arg Ser Glu Cys Asp Ser Tyr
 145 150 155 160
 Pro Glu Leu Leu Lys Asp Gly Cys His Trp Arg Phe Asp Trp Phe Glu
 165 170 175
 Asn Ala Asp Asn Pro Asp Phe Thr Phe Glu Gln Val Gln Cys Pro Lys
 180 185 190
 Ala Leu Leu Asp Ile Ser Gly Cys Lys Arg Ala
 195 200

<210> 7
 <211> 205
 <212> PRT
 <213> Cellulase variants

<400> 7
 Gly Ile Gly Gln Thr Thr Arg Tyr Trp Asp Cys Cys Lys Pro Ser Cys
 1 5 10 15
 Ala Trp Pro Gly Lys Gly Pro Ser Ser Pro Val Gln Ala Cys Asp Lys
 20 25 30
 Asn Asp Asn Pro Phe Asn Asp Gly Ser Thr Arg Ser Gly Cys Asp
 35 40 45
 Ala Gly Gly Ser Ala Tyr Met Cys Ser Ser Gln Ser Pro Trp Ala Val
 50 55 60
 Ser Asp Glu Leu Ser Tyr Gly Trp Ala Ala Val Lys Leu Ala Gly Ser
 65 70 75 80
 Ser Glu Ser Gln Trp Cys Cys Ala Cys Tyr Glu Leu Thr Phe Thr Ser
 85 90 95
 Gly Pro Val Ala Gly Lys Lys Met Ile Val Gln Ala Thr Asn Thr Gly
 100 105 110
 Gly Asp Leu Gly Asp Asn His Phe Asp Leu Ala Ile Pro Gly Gly Gly
 115 120 125
 Val Gly Ile Phe Asn Ala Cys Thr Asp Gln Tyr Gly Ala Pro Pro Asn
 130 135 140
 Gly Trp Gly Asp Arg Tyr Gly Gly Ile His Ser Lys Glu Glu Cys Glu
 145 150 155 160
 Ser Phe Pro Glu Ala Leu Lys Pro Gly Cys Asn Trp Arg Phe Asp Trp
 165 170 175
 Phe Gln Asn Ala Asp Asn Pro Ser Val Thr Phe Gln Glu Val Ala Cys
 180 185 190
 Pro Ser Glu Leu Thr Ser Lys Ser Gly Cys Ser Arg Ala
 195 200 205

<210> 8
 <211> 203
 <212> PRT
 <213> Cellulase variants

<400> 8
 Thr Ala Gly Val Thr Thr Arg Tyr Trp Asp Cys Cys Lys Pro Ser Cys
 1 5 10 15

Gly Trp Ser Gly Lys Ala Ser Val Ser Ala Pro Val Arg Thr Cys Asp
 20 25 30
 Arg Asn Gly Asn Thr Leu Gly Pro Asp Val Lys Ser Gly Cys Asp Ser
 35 40 45
 Gly Gly Thr Ser Phe Thr Cys Ala Asn Asn Gly Pro Phe Ala Ile Asp
 50 55 60
 Asn Asn Thr Ala Tyr Gly Phe Ala Ala Ala His Leu Ala Gly Ser Ser
 65 70 75 80
 Glu Ala Ala Trp Cys Cys Gln Cys Tyr Glu Leu Thr Phe Thr Ser Gly
 85 90 95
 Pro Val Val Gly Lys Lys Leu Thr Val Gln Val Thr Asn Thr Gly Gly
 100 105 110
 Asp Leu Gly Asn Asn His Phe Asp Leu Met Ile Pro Gly Gly Val
 115 120 125
 Gly Leu Phe Thr Gln Gly Cys Pro Ala Gln Phe Gly Ser Trp Asn Gly
 130 135 140
 Gly Ala Gln Tyr Gly Gly Val Ser Ser Arg Asp Gln Cys Ser Gln Leu
 145 150 155 160
 Pro Ala Ala Val Gln Ala Gly Cys Gln Phe Arg Phe Asp Trp Met Gly
 165 170 175 180
 Gly Ala Asp Asn Pro Asn Val Thr Phe Arg Pro Val Thr Cys Pro Ala
 180 185 190
 Gln Leu Thr Asn Ile Ser Gly Cys Val Arg Ala
 195 200

<210> 9
 <211> 203
 <212> PRT
 <213> Cellulase variants

<400> 9
 Thr Ser Gly Val Thr Thr Arg Tyr Trp Asp Cys Cys Lys Pro Ser Cys
 1 5 10 15
 Ala Trp Thr Gly Lys Ala Ser Val Ser Lys Pro Val Gly Thr Cys Asp
 20 25 30
 Ile Asn Asp Asn Ala Gln Thr Pro Ser Asp Leu Leu Lys Ser Ser Cys
 35 40 45
 Asp Gly Gly Ser Ala Tyr Tyr Cys Ser Asn Gln Gly Pro Trp Ala Val
 50 55 60
 Asn Asp Ser Leu Ser Tyr Gly Phe Ala Ala Ala Lys Leu Ser Gly Lys
 65 70 75 80
 Gln Glu Thr Asp Trp Cys Cys Gly Cys Tyr Lys Leu Thr Phe Thr Ser
 85 90 95
 Thr Ala Val Ser Gly Lys Gln Met Ile Val Gln Ile Thr Asn Thr Gly
 100 105 110
 Gly Asp Leu Gly Asn Asn His Phe Asp Ile Ala Met Pro Gly Gly Gly
 115 120 125
 Val Gly Ile Phe Asn Gly Cys Ser Lys Gln Trp Asn Gly Ile Asn Leu
 130 135 140
 Gly Asn Gln Tyr Gly Gly Phe Thr Asp Arg Ser Gln Cys Ala Thr Leu
 145 150 155 160
 Pro Ser Lys Trp Gln Ala Ser Cys Asn Trp Arg Phe Asp Trp Phe Glu
 165 170 175 180
 Asn Ala Asp Asn Pro Thr Val Asp Trp Glu Pro Val Thr Cys Pro Gln
 180 185 190
 Glu Leu Val Ala Arg Thr Gly Cys Ser Arg Ala
 195 200

<210> 10
 <211> 235
 <212> PRT
 <213> Cellulase variants

<400> 10
 Cys Asn Gly Tyr Ala Thr Arg Tyr Trp Asp Cys Cys Lys Pro His Cys
 1 5 10 15

a'

[illegible]

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 <211> 30
 <212> DNA
 <213> Humicola grisea

 <400> 12
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 <210> 13
 <211> 30
 <212> DNA
 <213> Humicola grisea

 <400> 13
 gaatgacttg gttgagtact caccagtcac 30

 <210> 14
 <211> 34
 <212> DNA
 <213> Humicola grisea

 <400> 14
 cactggcggc gacctgggat ctaaccactt cgat 34

 <210> 15
 <211> 37
 <212> DNA
 <213> Humicola grisea

 <400> 15
 atcgaagtgg ttagatccca ggtcgccgcc tgtgtctc 37

 <210> 16
 <211> 20
 <212> DNA
 <213> Humicola grisea

 <400> 16
 cgacttcaat gtccagtcgg 20

 <210> 17
 <211> 26
 <212> DNA
 <213> Humicola grisea

 <400> 17
 gcgctctaga ggattaaagg cactgc 26

 <210> 18
 <211> 35
 <212> DNA
 <213> Humicola grisea

 <400> 18
 cgacctggga tcgaacgact tcgatatgc catgc 35

 <210> 19
 <211> 30
 <212> DNA
 <213> Humicola grisea

 <400> 19
 cgactccagc ttccccgtct tcacgcccc 30

<210> 20
 <211> 34
 <212> DNA
 <213> Humicola grisea

<400> 20
 cgagcttcta gatctcgact agaggcactg ggag 34

<210> 21
 <211> 27
 <212> DNA
 <213> Humicola grisea

<400> 21
 ggatgccatg cttggaggat agcaacc 27

<210> 22
 <211> 29
 <212> DNA
 <213> Humicola grisea

<400> 22
 gggggcgtga agacgggaag ctggagtcg 29

<210> 23
 <211> 1261
 <212> DNA
 <213> Humicola grisea

<400> 23
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 gctcctattt tccgcacggc cctggcggct gcgctcccc ttgccgcact cgccgcgat 120
 ggcaagtcca ccagatactg ggactgctgc aagccatcgt gctcttggcc cggaaaggca 180
 ctctgaacc agcctgtctt cacttgcgac gccaaattcc agcgcatac cgaccccaat 240
 accaagtccg gctgcgatgg cggctcggcc ttttcgtgtg ctgaccagac cccctgggct 300
 ctgaacgacg atgtgcgcta tggtctcgct gccacggcta tttcgggtgg atcggaagcc 360
 tcgtgtgtct gcgcatacta cgctcttact ttcacctcgg gccctgtggc cggcaagacc 420
 atggtcgtcc agtcgaccaa caccggcggc gatctcggca gcaaccattt cgacctccag 480
 attccaggcg gcggtgtcgg catctttgat ggggtgcacc cccagttcgg aggtctcgct 540
 ggcgaaacct acggtggcat ctccagaccgc agctcctgcg actcgttccc tgcggcgctc 600
 aagcccggct gctctggcg ctctgattgg ttcaagaacg ccgacaacct gacctttacc 660
 ttcaagcagg tgcagtggcc cgccgagctt gttgccagga ccggctgcaa gcgcgaggat 720
 gacggcaact tccccgtctt caccgcccc gcgggtagca acaccggcg tagccagtcg 780
 agctccacta tcgcttccag ctccagctcc aaggctcaga ctccggccgc cagctccacc 840
 tccaaggctg tcgtgactcc cgtctccagc tccacctcga aggcgctga ggtccccaaa 900
 tccagctcga cctccaaggc tgccgaggtc gccaaagcca gctcaacttc gacctcgacc 960
 tcgacctcga ccaaggtcag ctgctctgcg accggtggct cctgcgtcgc tcagaagtgg 1020
 gcgcagtgcg gcggcaatgg cttcaccggc tgcacgtcgt gcgtcagcgg caccacctgc 1080
 cagaagcaaa atgactggta ctcccagtcg ctctaagtcg tttgtagtag cagtttgaag 1140
 gatgtcaggg atgagggagg gaggagtggg ggaaaagtac gccgcagttt tttggtagac 1200
 ttactgtatt gttgagtaat taccatttcg cttcttgtac gaaaaaaaaa aaaaaaaaaa 1260
 a 1261

<210> 24
 <211> 41
 <212> DNA
 <213> Humicola grisea

<400> 24
 gctgcaagcc gtctgtggc tggagcgcta acgtgccccg g 41

<210> 25
<211> 36
<212> DNA
<213> Humicola grisea

<400> 25
cgatgtttcc ggaggccact ttgacattct ggttcc

36

81
<210> 26
<211> 30
<212> DNA
<213> Humicola grisea

<400> 26
gaatgacttg gttgacgcgt caccagtcac

30
